

Advanced Cardiology

General Approach to Managing the Cardiac Patient

- Must be calm and reassuring
- Assessment and treatment should be prompt but not rushed
- Early intervention is crucial
- Treat the patient before he/she is given the opportunity to deteriorate

Impact of prehospital care

- Time is muscle

Assessment of the Cardiac Pt

- Perfusion status
- Breath sounds
- Hydration status

History and Medications

- Previous CV disease
- Other known diseases
- Current medications
 - Nitrates
 - Beta blockers
 - Diuretics
 - ACE inhibitors
 - Calcium channel blockers

General Management of the Cardiac Patient

- Calm and reassure
- Begin treatment promptly (where found)
- O2, IV, ECG
- Symptom specific treatments
 - Chest pain
 - Pulmonary edema
 - Hypotension
 - Hypertension

Common Cardiovascular Disease States

Atherosclerosis

- The underlying cause of a number of cardiovascular diseases
- Pathophysiology
 - Hypercholesterolemia
 - Plaque formation
 - Plaque release

- Modifiable risk factors
 - Smoking
 - Diet
 - Lifestyle
 - Hypertension
- Non-modifiable risk factors
 - Genetics

Stages of Oxygen Deprivation

- Hypoxia
- Ischemia
 - Reversible
- Injury
 - Partially reversible
- Infarction
 - Necrosis
 - Non-reversible

Angina

- Ischemia
- Injury
- Presentation
 - Chest pain (2/3 of patients)
 - Dyspnea
 - Anginal equivalents (1/3 - no chest pain)
 - Weakness
 - Dizziness
 - Fatigue
 - Etc.

Angina

- Management
 - Oxygen
 - IV
 - Monitor
 - Ntg (repeat to total of 3)
- Relief from Ntg

Infarction

- Severity and duration of pain
- Alterations in vital signs
- Dysrhythmias
- ECG changes
 - ST elevation
 - T wave inversion
 - New bundle branch block
 - New Q wave

Infarction

- Management
 - O2--IV--Monitor
 - Treat arrhythmias
 - Ntg. SL (to max of 3)
- No relief from Ntg.
 - Aspirin 324 mg
 - Morphine
 - (Beta blockers)

Congestive Heart Failure (CHF)

- Pathophysiology
 - Imbalance in cardiac output (pump failure)
 - Primary left side
 - Primary right side
 - End result--left and right
- Causes
 - AMI
 - Valve disease
 - Obstruction
 - Cardiomyopathy

Congestive Heart Failure (CHF)

- Symptoms: Left side failure
 - Orthopnea
 - Rales
 - Dyspnea

Congestive Heart Failure (CHF)

- Symptoms: Right side failure
 - Weight gain/clothes or shoes too small
 - Dependent edema
 - 1+, 2+, 3+, 4+
 - Ascites
 - Hepatojugular reflux

Congestive Heart Failure (CHF)

- Management
 - O2, IV, monitor
 - Position
 - Peripheral vasodilator
 - Nitroglycerin (Ntg)
 - Morphine
 - Diuretic
 - Furosemide (Lasix)

Clinical Dilemma

- Differentiating CHF from COPD
 - Breath sounds
 - Localized vs diffuse
 - Dependent edema
 - Onset and progression

Cardiogenic Shock

- Left ventricular infarction
- Decreased cardiac output
 - Weakened left ventricle
 - Decreased stroke volume
- Other causes
 - Bradycardia
 - Tachycardia
 - Valve defects
 - Cardiomyopathy
 - Obstruction (eg tamponade)

Cardiogenic Shock- Cont

- Management
 - IV/O2/ECG
 - Fluid challenge (?)
 - Vasopressor
 - Inotropic agent

Aortic Dissection

- Pathophysiology
 - Medical
 - Trauma
- Presentation
 - Pain
 - Pulses
 - Pulsation

- Management
 - Calm and reassure patient
 - Keep patient supine and inactive
 - O2
 - IV at KVO
 - ECG
 - Lower BP if indicated

Valve Defects

- Aortic stenosis
 - Thickening of proximal aorta
 - Decreased aortic lumen
- S/S
 - Decreased stroke volume
 - Blood backs up into lungs
- Management
 - As for left side CHF

- Pulmonic stenosis
 - Narrowing of pulmonary vessels
 - Decreased right ventricular stroke volume
 - Blood backs up into periphery
 - Sudden cardiac death
- Management
 - O2, IV, ECG
 - Manage supportively

- Mitral valve prolapse
 - Mitral valve loses efficiency
 - Signs/symptoms
 - Regurgitation
 - Decreased ventricular stroke volume
 - Chest pain (often preceded by atrial fib)
- Management
 - O2, IV, ECG
 - Decrease afterload
 - Ntg.

Pericardial Tamponade

- Pathophysiology
 - Fluid accumulates in pericardium
 - Traumatic
 - Medical
- S/S
 - Dyspnea
 - Hypotension
 - Distant/muffled heart tones
 - Electrical alternans

Pericardial Tamponade

- Management
 - O2/IV/ECG
 - Fluid challenge
 - Peripheral vasodilator
 - Pericardiocentesis

Hypertensive Emergencies

- Types:
 - Hypertensive encephalopathy
 - Stroke/TIA
 - Aortic aneurysm
 - Traumatic brain injury

Hypertensive Encephalopathy

- BP increases until symptoms result
 - Headache
 - Dizziness
 - N/V
- No neurologic deficit
- Diagnostic dilemma
- Management
 - O2/IV/ ECG
 - Supportive

Stroke/TIA

- Types
 - Ischemia (80%)
 - Hemorrhagic (20%)
- Diagnostic dilemma
- Management
 - IV/O2/ECG
 - Oxygen - No more than 4 l/NBP initially
 - Supportive care

Peripheral Vascular Disease

- Atherosclerosis in peripheral vessels
 - Insidious onset
- Deep vein thrombosis (DVT)
 - Acute onset
 - Risk factors
 - Prolonged bed rest or immobilization
 - Recent trauma or surgery
 - Smoking
 - Decreased perfusion (CHF, shock)
 - Diabetes, hypertension
 - Pregnancy, obesity

- S/S
 - Pain secondary to muscle use in extremity (claudication)
 - Decreased distal pulses
 - Temperature change

Pulmonary Embolus

- Embolus in pulmonary vessels
- Clinical presentation directly related to size of clot
 - Small - Dyspnea, weakness
 - Large - Sudden death
- Risk factors
 - Most emboli formed in lower extremities
 - Recent trauma/surgery
 - Atrial fibrillation/smoker

- Assessment
 - Breath sounds
 - Pain
 - Onset
 - Risk factors

- Management
 - High flow O2/IV/ECG
 - Intubate if needed
 - Fluid challenge if hypotensive

Scenarios

Scenario #1

- 48 y/o male c/o chest pain
- Pain radiates into jaw and left shoulder
- Pt also c/o nausea and dyspnea

Scenario #1--cont.

- Vital signs
 - BP-144-92
 - P-108 SR
 - R-20 RN
 - Monitor- Sinus tachycardia
 - Pulse oximeter- 92%

Scenario #1--cont.

- History
 - Angina x several years
 - Hypercholesterolemia
 - Smoker for 30 years
 - Hypertension

Scenario #1-cont.

- Physical exam
 - Skin pale and moist
 - Few basal rales bilaterally
 - 1+ pitting pedal edema
 - Abdomen soft and non tender
 - No other pertinent findings

Scenario #1-cont.

- Impression?
 - Signs/symptoms and history suggestive of myocardial ischemia/infarction

Scenario #1-cont.

- Treatment
 - Calm and reassure
 - Position of comfort
 - O2/IV/monitor
 - (MONA)
 - Nitroglycerine
 - Repeat nitroglycerine
 - Morphine and aspirin
 - 12 lead if available

Scenario #2

- 62 y/o female c/o weakness and dyspnea
- Admits to nausea and feeling of impending doom
- Symptoms began yesterday and have worsened since
- Chest pain yesterday--gone now

Scenario #2-cont.

- Vital signs
 - BP-74/48
 - P-118 WR
 - R-28
 - Monitor- Sinus tachycardia, occasional PVC

Scenario #2-cont.

- History
 - 2 previous AMIs
 - Hypertension
 - Long term smoker

Scenario #2-cont.

- Physical exam
 - Pale and cool
 - Diaphoretic
 - Rales bilaterally
 - JVD at 45 degrees
 - Abdomen soft and non tender

Scenario #2-cont.

- Treatment
 - O2/IV/monitor
 - Blood pressure management
 - Fluid?
 - Dopamine?
 - Diuretic?